

see whether the operator has chosen to manually override the system, as indicated in the box in the flow chart. If an override is in effect, the coupon validation logic will have sent a logic bit "1" to the device. This bit will be checked periodically to determine what to do.

Next the system reads the "CENTER" or "CENTER" This is the first sensor near the top of the coupon chute in the device (see FIG. 11). The system checks when (and whether) the coupon was entered into the device. A clock function is shown in the flow chart, representing a simple timing sequence to assure that excessive time does not occur before a beam is scanned. If the allowable clock time is exceeded, a message is displayed such as "please insert coupon or close door".

The coupon is scanned by the system as soon as it is available, as indicated in the flow chart. If the bar code is read correctly, then the data is buffered and a series of simple validation checks are performed as described below, preferably in the scanner device since the checks are simple and can be accomplished quickly. First, as indicated in the chart under the location "3" (FIG. 15C), the first character of the code is checked to be sure it is "5" (representing a coupon). If not, a signal is sent to the coupon validation logic that there is an error, and this is displayed as indicated in the flow chart.

Also, a check is preferably made for any additional data bar coded on the coupon, beyond the standard bar code (see FIG. 13, e.g.). That information can also be read by the scanner and passed to the coupon validation logic. (Certain variations, such as the inclusion of an expiration date in the coded data, can be handled by software in the device, as accomplished with the number system described above.)

The data is passed to the coupon validation logic, which will determine whether the coupon correlates to any of the items purchased. This can be accomplished in any of several locations—cash register software, controller software that runs the cash registers, or a separate device such as a PC computer attached to the network. It can also be in the POS scanner device itself. The important thing is that the correlation have access to the UPC number with family code and price.

As indicated in the flow chart, the coupon validation logic sends a logic bit back to the scanner device signaling one of two things: (1) the coupon is valid, therefore execute further logic to assure the coupon passes through the device to the secure area, or (2) the coupon is not valid, therefore reverse the motor and reject the coupon.

If the coupon is not "valid" or redeemable, the operator may still be given the power to override this manually, as indicated.

At location "4" in the flow chart, FIG. 15D, it is indicated that the coupon scanner system now reads "CLEAVE" to be sure that the coupon passed the second sensor (FIG. 11) in the pathway to the secure area, indicating correct travel through the device. See also Table 1, above. This is also subject to a clock loop as indicated, assuring that excessive time does not pass (as if the coupon is not properly moving through the system).

Next, the scanner system again reads "CENTER", after a clock reset, in order to assure that the coupon is not removed and it has passed properly through the system. The first sensor along the path should be reset (back to "0"), before CLEAVE transitions back to "0".

If this transition does not occur in this logical order, the conclusion is that the coupon was removed by the

operator, or the system is jammed. A normal error condition message is displayed, and the device attempts to reject the coupon, as indicated in the flow chart.

Next, a signal is generated that the coupon is valid and has securely moved through the coupon scanner, as indicated under "5" in the flow chart. Confirmation is sent to the POS system and the coupon validation logic. The device then preferably indicates this by a "beep" and the activation of a green signal light, which can advantageously be the same signalling the operator receives when a purchase item is read. A coupon transaction record is written, and the system returns to the location "B", i.e. if there are more coupons it loops through the same procedure again and if not, the clock is set, the coupon scanner door is closed and the normal POS scanner is re-enabled.

The coupon transaction record includes all relevant information about the transaction, the UPC number of the item purchased and of the coupon, the amount of credit, the time of the transaction and other required data. The record is stored for later batch reconciliation, or it may be used in an on-line fashion for electronic clearing, wherein the manufacturer will be debited and the retailer will be credited. This electronic clearing or electronic data interchange system is advantageous in eliminating one or more levels of clearing in the usual coupon clearing system.

While we have illustrated and described the preferred embodiments of my invention, it is to be understood that these are capable of variation and modification and we therefore do not wish to be limited to the precise details set forth, but desire to avail ourselves of such changes and alterations as fall within the purview of the following claims.

We claim:

1. A point-of-sale bar code reader for retail stores, having a housing, a reading beam, scanning optics for producing scan lines with the reading beam, collection optics and bar code decoding software, and for reading and verifying the use of redemption coupons bearing bar codes, as well as reading items for purchase in a consumer transaction, comprising,

redemption coupon receiving means associated with the housing of the bar code reader,

coupon detection means for signifying in the decoding software that a redemption coupon is being read, as opposed to a purchased item,

coupon reading means associated with the scanning optics of the bar code reader for scanning and reading a redemption coupon using the same reading beam used in the scanning optics, when a redemption coupon is placed at said redemption coupon receiving means,

the coupon receiving means including a slot configured to receive a coupon, coupon sensing means at the slot, activation means for placing the bar code reader in a coupon reading mode when a coupon has been placed in the slot and sensed by the coupon sensing means, means for drawing the coupon through the slot for the coupon to be read, and associated means for interrupting a normal product reading scanning pattern generated by the scanning optics to divert a reading beam to the position of the redemption coupon, serving as said coupon reading means,

means for decoding the redemption coupon's bar code using the same bar code decoding software used for purchased products, and

correlation means for comparing the decoded information from a redemption coupon bar code with a list of purchases as determined from bar codes of purchased items in the same consumer transaction, and for determining whether the consumer should be credited in a redemption amount associated with the coupon, based on whether an appropriate qualified item has been purchased to qualify for coupon redemption

2. A point-of-sale product and coupon bar code reader system for retail stores, including a product bar code reader having a housing, a reading beam, scanning optics for producing scan lines with the reading beam, collection optics and bar code decoding software, and for reading and verifying the use of redemption coupons bearing bar codes, as well as reading items for purchase in a consumer transaction, comprising,

redemption coupon receiving means associated with the bar code reader,

coupon detection means for signifying in the decoding software that a redemption coupon is being read, as opposed to a purchased item,

coupon reading means connected to the bar code reader for scanning and reading a redemption coupon when a redemption coupon is placed at said redemption coupon receiving means,

decode means for decoding the redemption coupon's bar code using the same bar code decoding software used for purchased products,

correlation means for comparing the decoded information from a redemption coupon bar code with information representing purchases as determined from bar codes of purchased items in the same consumer transaction, and for determining whether the consumer should be credited in a redemption amount associated with the coupon, based on whether an appropriate qualified item has been purchased to qualify for coupon redemption, and

the coupon reading means including movable door means providing an opening for insertion of a coupon, serving as said redemption coupon receiving means, beam diverting means for diverting the product bar code reader's reading beam to scan a coupon when it is placed through the coupon opening, and coupon securing means for engaging a coupon and delivering it into a secure area after the coupon has been determined to be valid and redeemable.

3. The system of claim 2, further including coupon cancellation means for making a physical indication of cancellation on the coupon after it has been determined to be valid and redeemable.

4. A point-of-sale product and coupon bar code reader system for retail stores, including a product bar code reader having a housing, a reading beam, scanning optics for producing scan lines with the reading beam, collection optics and bar code decoding software, and for reading and verifying the use of redemption coupons bearing bar codes, as well as reading items for purchase in a consumer transaction, comprising,

redemption coupon receiving means associated with the bar code reader,

coupon detection means for signifying to the decoding software that a redemption coupon is being read, as opposed to a purchased item,

coupon reading means connected to the bar code reader for scanning and reading a redemption coupon

when a redemption coupon is placed at said redemption coupon receiving means,

decode means for decoding the redemption coupon's bar code using the same bar code decoding software used for purchased products,

correlation means for comparing the decoded information from a redemption coupon bar code with information representing purchases as determined from bar codes of purchased items in the same consumer transaction, and for determining whether the consumer should be credited in a redemption amount associated with the coupon, based on whether an appropriate qualified item has been purchased to qualify for coupon redemption, and

the redemption coupon receiving means comprising an openable door adjacent to the product bar code reader for receiving coupons entered by an operator, and wherein the coupon reading means comprises movable mirror means for diverting the reading beam of the product bar code reader to a coupon scanning location when a coupon is to be read, and further including isolation means for sealing the scanning optics of the product bar code reader from a path through which the coupon travels.

5. The system of claim 4, further including means for engaging the coupon after it has been scanned and determined to be valid and redeemable, and for drawing the coupon away from the coupon receiving means and out of the reach of the operator

6. The system of claim 5, further including a secure container, and including means associated with the coupon engaging means for delivering the validated coupon into the secure container.

7. The system of claim 6, further including coupon diverting means for directing the validated coupon in either of two flow paths after validation, leading to different areas of the secure container depending upon classification of the coupon.

8. A point-of-sale product and coupon bar code reader system for retail stores, including a product bar code reader having a housing, a reading beam, scanning optics for producing scan lines with the reading beam, collection optics and bar code decoding software, and for reading and verifying the use of redemption coupons bearing bar codes, as well as reading items for purchase in a consumer transaction, comprising,

redemption coupon receiving means associated with the bar code reader,

coupon detection means for signifying to the decoding software that a redemption coupon is being read, as opposed to a purchased item,

coupon reading means connected to the bar code reader for scanning and reading a redemption coupon when a redemption coupon is placed at said redemption coupon receiving means,

decode means for decoding the redemption coupon's bar code using the same bar code decoding software used for purchased products,

correlation means for comparing the decoded information from a redemption coupon bar code with information representing purchases as determined from bar codes of purchased items in the same consumer transaction, and for determining whether the consumer should be credited in a redemption amount associated with the coupon, based on whether an appropriate qualified item has

been purchased to qualify for coupon redemption, and

the coupon reading means including movable door means providing an opening for insertion of a coupon, serving as said redemption coupon receiving means, beam diverting means for diverting the product bar code reader's reading beam to scan a coupon when it is placed through the coupon opening, and coupon cancellation means for cancelling the coupon and preventing future use of the coupon after it has been determined to be valid and redeemable.

9. The system of claim 8, wherein the coupon cancelling means comprises means for mutilating the coupon to the extent that it cannot be read as valid in a future transaction.

10. The system of claim 8, wherein the coupon cancelling means comprises means for applying ink to the coupon to prevent reading of the coupon's bar code in a future transaction.

11. A point-of-sale bar code reader for retail stores, having a housing, a reading beam, scanning optics for producing scan lines with the reading beam, collection optics and bar code decoding software, and for reading and verifying the use of redemption coupons bearing bar codes, as well as reading items for purchase in a consumer transaction, comprising,

redemption coupon receiving means associated with the housing of the bar code reader,

coupon detection means for signifying in the decoding software that a redemption coupon is being read, as opposed to a purchased item,

coupon reading means associated with the scanning optics of the bar code reader for scanning and reading a redemption coupon using the same reading beam used in the scanning optics, when a redemption coupon is placed at said redemption coupon receiving means,

means for decoding the redemption coupon's bar code, and correlation means for comparing the decoded information from a redemption coupon bar code with a list of purchases as determined from bar codes of purchased items in the same consumer transaction, and for determining whether the consumer should be credited in a redemption amount associated with the coupon, based on whether an appropriate qualified item has been purchased to qualify for coupon redemption, and

the coupon reading means including movable door means providing an opening for insertion of a coupon, serving as said redemption coupon receiving means, beam diverting means for diverting the product bar code reader's reading beam to scan a coupon when it is placed through the coupon opening, and coupon securing means for engaging a coupon and delivering it into a secure area after the coupon has been determined to be valid and redeemable.

12. The system of claim 11, further including coupon cancellation means for making a physical indication of cancellation on the coupon after it has been determined to be valid and redeemable.

13. A point-of-sale bar code reader for retail stores, having a housing, a reading beam, scanning optics for producing scan lines with the reading beam, collection optics and bar code decoding software, and for reading and verifying the use of redemption coupons bearing

bar codes, as well as reading items for purchase in a consumer transaction, comprising,

redemption coupon receiving means associated with the housing of the bar code reader,

coupon detection means for signifying in the decoding software that a redemption coupon is being read, as opposed to a purchased item,

coupon reading means associated with the scanning optics of the bar code reader for scanning and reading a redemption coupon using the same reading beam used in the scanning optics, when a redemption coupon is placed at said redemption coupon receiving means,

means for decoding the redemption coupon's bar code, and correlation means for comparing the decoded information from a redemption coupon bar code with a list of purchases as determined from bar codes of purchased items in the same consumer transaction, and for determining whether the consumer should be credited in a redemption amount associated with the coupon, based on whether an appropriate qualified item has been purchased to qualify for coupon redemption, and

the redemption coupon receiving means comprising an openable door adjacent to the product bar code reader for receiving coupons entered by an operator, and wherein the coupon reading means comprises movable mirror means for diverting the reading beam of the product bar code reader to a coupon scanning location when a coupon is to be read, and further including isolation means for sealing the scanning optics of the product bar code reader from a path through which the coupon travels.

14. The system of claim 13, further including means for engaging the coupon after it has been scanned and determined to be valid and redeemable, and for drawing the coupon away from the coupon receiving means and out of reach of an operator.

15. The system of claim 14, further including a secure container, and including means associated with the coupon engaging means for delivering the validated coupon into a secure container.

16. The system of claim 15, further including coupon diverting means for directing the validated coupon in either of two flow paths after validation, leading to different areas of the secure container depending upon classification of the coupon.

17. A point-of-sale bar code reader for retail stores, having a housing, a reading beam, scanning optics for producing scan lines with the reading beam, collection optics and bar code decoding software, and for reading and verifying the use of redemption coupons bearing bar codes, as well as reading items for purchase in a consumer transaction, comprising,

redemption coupon receiving means associated with the housing of the bar code reader,

coupon detection means for signifying in the decoding software that a redemption coupon is being read, as opposed to a purchased item,

coupon reading means associated with the scanning optics of the bar code reader for scanning and reading a redemption coupon using the same reading beam used in the scanning optics, when a redemption coupon is placed at said redemption coupon receiving means,

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means for decoding the redemption coupon's bar code, and correlation means for comparing the decoded information from a redemption coupon bar code with a list of purchases as determined from bar codes of purchased items in the same consumer transaction, and for determining whether the consumer should be credited in a redemption amount associated with the coupon, based on whether an appropriate qualified item has been purchased to qualify for coupon redemption, and

the coupon reading means including movable door means providing an opening for insertion of a coupon, serving as said redemption coupon receiving means, beam diverting means for diverting the

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product bar code reader's reading beam to scan a coupon when it is placed through the coupon opening, and coupon cancellation means for cancelling the coupon and preventing future use of the coupon after it has been determined to be valid and redeemable.

18. The system of claim 17, wherein the coupon cancelling means comprises means for mutilating the coupon to the extent that it cannot be read as valid in a future transaction

19 The system of claim 17, wherein the coupon cancelling means comprises means for applying ink to the coupon to prevent reading of the coupon's bar code in a future transaction.

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20. An optical scanner for optically scanning a bar code, said optical scanner comprising:

a housing;

a first scanning system, housed in said housing, for emitting a first scanning beam which passes through a first area on said housing, the first scanning beam being focused at a first focal position at a distance from the first area and moving in a first scanning pattern, the first scanning beam suitable for optically scanning a first type of bar code; and

a second scanning system, housed in said housing, for emitting a second scanning beam which passes through a second area on said housing, the second area being different from the first area, the second scanning beam being focused at a second focal position at a distance from the second area and moving in a second scanning pattern, the distance from the first focal position to the first area being different than the distance from the second focal position to the second area, the second scanning beam suitable for optically scanning a second type of bar code which is different from the first type of bar code.

21. An optical scanner for optically scanning a bar code, said optical scanner comprising:

a housing;

a first scanning system, housed in said housing, for emitting a first scanning beam from a predetermined surface of said housing, the first scanning beam moving in a first scanning pattern;

a second scanning system, housed in said housing, for emitting a second scanning beam from the predetermined surface of said housing, the second scanning beam moving in a second scanning pattern, a scanning line included in the second scanning pattern is longer than a scanning line included in the first scanning pattern.

22. An optical scanner for optically scanning a bar code, comprising:

a housing which includes a window, the window having first and second surface areas thereon and which are different from each other;

a first scanning system, housed in the housing, for emitting a scanning beam which passes through the first surface area on the window and forms a cross-line pattern; and

a second scanning system, housed in the housing, for emitting a scanning beam which passes through the second surface area on the window and forms a line pattern on the second surface area.

23. An optical scanner for optically scanning a bar code, said optical scanner comprising:

a housing;

a first scanning system, housed in said housing, for emitting a first scanning beam which passes through a first area on said housing, the first scanning beam being focused at a first focal position and moving in a first scanning pattern;
and

a second scanning system, housed in said housing, for emitting a second scanning beam which passes through a second area on said housing, the second area being different from the first area, the second scanning beam being focused at a second focal position different from the first focal position and moving in a second scanning pattern, wherein a number of scanning lines included in the first scanning pattern is greater than a number of scanning lines included in the second scanning pattern.

24. An optical scanner according to Claim 23 wherein first scan pattern comprises a plurality of intersecting scan lines and the second scan pattern comprises a single scan line.

25. A method for scanning optical codes comprising the steps of:

providing a housing with a first window and a second window:

generating a first scanning beam, passing the first scanning beam out through the first window, focusing the first scanning beam at a first focal position at a distance from the first window, and moving the first scanning beam in a first scanning pattern, the first scanning beam suitable for optically scanning a first type of bar code; and

a generating a second scanning beam, passing the second scanning beam out through the second window, focusing the second scanning beam at a second focal position at a distance from the second window, and moving the second scanning beam in a second scanning pattern, the distance from the first focal position to the first window being different than the distance from the second focal position to the second window, the second scanning beam suitable for optically scanning a second type of bar code which is different from the first type of bar code.

26. A method according to Claim 25 further comprising generating the first scan pattern comprised of intersecting scan lines and the second scan pattern comprised of a single scan line.

27. A method according to Claim 25 wherein the first type of bar code comprises bar code labels on items being purchased and the second type of bar code comprises bar codes on coupons.

28. A method for optically scanning comprising the steps of

providing a housing with first and second surface areas thereon and which are different from each other;

generating a first scan pattern of intersecting scan lines and passing the first scan pattern out through the first surface area; and

generating a second scan pattern consisting of a single scan line and passing the second scan pattern out through the second surface area.

29. A method for scanning optical codes comprising the steps of:

providing a housing with at least a first window;

scanning the first scanning beam to produce a first scan pattern of a plurality of intersecting scan lines and passing the first scan pattern out from the housing to scan an item to be read; and

a generating a second scanning beam and focusing the
second scanning beam at a second focal distance different from
the first focal distance;

scanning the second scanning beam to produce a second scan pattern of a single scan line and passing the second scan pattern out from the housing to scan an item to be read.